

NASA Glenn Safety Manual

CHAPTER 12 - AVIATION SAFETY

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12.1 SCOPE

The Glenn Research Center Aviation Safety Program (GRC-M7040.004) establishes policy, responsibilities, and guidelines, and sets forth procedures and requirements to ensure the safety of personnel and equipment and the safe conduct of aviation functions and activities. This Program is tailored to the Glenn organization and its aircraft mission. The Glenn aviation safety plan follows the guidelines set forth in NPG 8715.5 NASA Safety Manual Procedures and Guidelines and the NPG 7900 series. Other documents referenced are listed in Section 12.9.

12.2 POLICY

Safety is a line-management responsibility; therefore, this Program provides line management oversight of Glenn aviation functions and activities. Aircraft operations shall be conducted under the cognizance of the Glenn Safety Organization, and no aircraft or experiment shall be committed to flight without a valid Safety Permit or appropriate safety approval. It is the intent of this Program to comply with all applicable NASA directives, and other governing instructions when applicable.

12.3 RESPONSIBILITIES/FUNCTIONS

Although aviation safety is everyone's concern, the primary responsibility rests with the Center Director and the Flight Operations Manager.

To ensure effective implementation of the Glenn Aviation Safety Program, responsibilities/functions are assigned as follows:

12.3.1 Center Director

The Center Director is responsible for ensuring the safe operation of all aircraft assigned to Glenn Research Center. In part, the Director will ensure that

- a. Aviation safety is an integral part of the overall Glenn Safety Program.
- b. Glenn complies with all NASA aircraft management policies and directives as established by higher authority.
- c. An appropriate aircraft operations staff is in place and is properly organized, equipped, and trained to provide for the conduct of safe and effective flight operations.

- d. The aircraft operations organization has an established aviation safety program commensurate with the level and type of flight activity, and that appropriate oversight is provided.
- e. The aircraft operations organization supports the NASA Intercenter Aircraft Operations Panel (IAOP), which, in turn, supports the Associate Administrator for Management (Code J) in the development of guidance on operational aspects of aviation safety; the Associate Administrator for Safety and Mission Quality (Code Q) in the development of overall aviation safety policies; and the Aircraft Management Office (Code JP) in establishing review teams to periodically review all aspects of aircraft operations at NASA installations.

12.3.2 Aircraft Operations Office Chief

The Chief of the Aircraft Operations Office is the designated Flight Operations Manager. Under the cognizance of the Center Director, the Chief is responsible for safe operation of all assigned Glenn aircraft. In particular, he/she will ensure that the following elements and functions are a part of the Aviation Safety Program:

- a. A flight operations handbook outlining procedures, requirements, and guidelines for conducting safe flight operations (“Glenn Aircraft Operations Manual”, GRC-M7040.002”)
- b. An organization that is actively conducting airworthiness reviews for research aircraft or projects, using a multidisciplinary, system-type approach and functioning independent of line management, and that these reviews are documented (in the “Glenn Research Flight Operations and Airworthiness Procedures”, GRC-M7040.003”)
- c. A configuration control system to ensure real-time monitoring and documentation
- d. Training for initial checkout and currency requirements

The chief of aircraft maintenance, under the cognizance of management authority, is responsible for maintaining all Glenn aircraft and for ensuring compliance with the provisions of this chapter.

12.3.3 Aviation Safety Officer

The Aviation Safety Officer (ASO) is a Glenn pilot designated by the Executive Safety Board chairman. As such, the ASO is the Center's focal point on flight research. The ASO is the Center's focal point for flight experiment airworthiness. In addition, ASO is responsible for reviewing and evaluating proposed modifications to the aircraft and experiments to be flown thereon. The ASO is responsible for reviewing flight work orders as required per Research Flight Operations and Airworthiness Procedures Manual (GRC-M740.003). He/She is the focal point on flight\ground operating procedures and practices for Glenn Aircraft, and for reviewing and evaluating flight profiles, training and performance requirements, and any aircraft operating limitations. Creating, implementing

and managing an Aviation Safety Program including mishap response and reporting is also the responsibility of the ASO. Although the Chief of the Aircraft Operations Office has direct responsibility for flight safety, should the need arise, the ASO has unrestricted access on matters affecting flight safety to the Executive Safety Board chairman and if necessary, the Center Director. In this capacity, the ASO has the authority to shut down any operation or activity in question until an appropriate review can be conducted (see “Research Flight Operations and Airworthiness Procedures”, GRC-M7940.003 and the "Aircraft Operations Manual", GRC-M7040.002).

12.3.4 Pilot In Command

A Glenn aircraft Pilot In Command (PIC) has the final responsibility and authority to ensure the safe operation of the aircraft and the safety of passengers or crewmembers who may be involved in research activities on board the aircraft.

12.3.5 Airworthiness and Configuration Control Manager

The Airworthiness and Configuration Control Manager (ACCM) is responsible for coordinating and documenting airworthiness reviews and for maintaining documentation necessary to completely define an aircraft's immediate configuration. (“Research Flight Operations and Airworthiness Procedures”, GRC-M740.003 and the “Aircraft Operations Manual” GRC-M740.002)

12.3.6 Area Safety Committee

The Aviation Safety Committee (ASC), as established in Chapter 1 of the Glenn Safety Manual, reviews operations of and R&D modifications to aircraft operated by Glenn, as well as experiments placed on these aircraft. The ASC is the sole authority for Glenn aircraft/flight experiment Safety Permits. The hazard analysis and airworthiness review process used by the ASC is described in further detail in “Research Flight Operations and Airworthiness Procedures”, GRC-M7040.003 and the “Aircraft Operations Manual”, GRC-M7040.002.

12.4 PROPOSED PROJECT/EXPERIMENT APPROVAL

To enhance safety and ensure management overview at an early stage, any Glenn division proposing an airborne project/flight experiment shall prepare a memorandum detailing the principal objectives and specific requirements. This memorandum will be routed for operational approval to the Director of Engineering and Technical Services. For non-Glenn-originated experiments, a Space Act Agreement will be initiated by the proposing organization and sent to the Center Director for signature. The signing authority for the proposing organization should be at least the same managerial level as the Center Director (GRC-M7040.003).

12.5 AIRWORTHINESS AND FLIGHT EXPERIMENT REVIEWS

12.5.1 Purpose

The purpose of these reviews is to assure management that the risks to persons and property are minimized and that the operational plans for conducting a mission/program have been approved. Formal review requirements must be commensurate with the significance of the mission/project and the risk involved. The Aviation Safety Committee conducts these reviews independent of line management. This review process is a multidisciplinary, system-like approach that includes appropriate safety analysis and risk assessment. Such reviews are formally conducted and fully documented. They are applicable to all aircraft modifications and flight experiments as per GRC-M7040.003. The process and details can be found in “Research Flight Operations and Airworthiness Procedures”, GRC-M7040.003.

12.6 AVIATION SAFETY PROGRAM

The **Aviation Safety Program** (GRC-M7040.004) is designed to ensure a high level of operational safety awareness in day-to-day aircraft operations among flight and ground crews. It is implemented and managed by the Aviation Safety Officer and will include the following elements:

- a. Risk assessment/hazard analysis
- b. Mishap and near mid-air collision reporting and investigating.
- c. Project/program safety plans.
- d. Design reviews, aircraft configuration management, flight and test readiness reviews.
- e. Training, education, and awareness.
- f. Aviation safety inspection/surveys.
- g. Hazard reporting and investigation.

12.7 CONFIGURATION CONTROL PLAN

Configuration control is a vital part of any aviation safety program. The Airworthiness and Configuration Control Manager is responsible for coordinating this plan. A very important aspect of this system is the flight work order document. The process and details of this plan, as well as the flight work order procedures, can be found in “Research Flight Operations and Airworthiness Procedures”, GRC-M7040.003 and the "Aircraft Operations Manual", GRC-M7040.002.

12.8 MEDICAL CLEARANCE AND PHYSIOLOGICAL REQUIREMENTS

Medical clearance and physiological requirements shall be in accordance with NPG 7900.3A, NPG 7900.4A, and the "Glenn Aircraft Operations Manual", GRC-M7040.002. In general, all Glenn pilots are required to obtain an FAA first-class medical certificates or Military Equivalent, annually. Flight crewmembers and research personnel require FAA third-class medical certificates or equivalent medical clearance from the GRC Flight Examiner. Physiological, EGRESS, and life-support training shall be accomplished as required in the “Aircraft Operations Manual”. Training and certification records shall be kept in an Aircraft Operations Office file (per the "Glenn Aircraft Operations Manual", GRC-M7040.002).

12.9 BIBLIOGRAPHY

- “Aircraft Operations Manual”, 1999 GRC M7040.003, NASA Glenn Research Center, Cleveland, OH.
- “Research Flight Operations and Airworthiness Procedures”, GRC M7040.003, NASA Glenn Research Center Handbook.
- MIL-HDBK-5, 1990. Military Handbook. Metallic Materials and Elements for Aerospace Vehicle Structures.
- NPG 8715.3, “NASA Basic Safety Manual” Chapter 7, Aviation Safety.
- NPG 7900.3A, “Aircraft Operations Management”.
- NPG 7900.4A, “NASA aircraft Operations Management”.
- Title 14, “Code of Federal Regulations”,
 - Pt. 23. Federal Aviation Administration. Federal Air Regulations. Airworthiness Standards: Normal, Utility, Acrobatic, and Commuter Category Airplanes.
 - Pt. 25. Airworthiness Standards: Transport Category Airplanes.
 - Pt. 43. Maintenance, Rebuilding, and Alteration.

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